Estimation of phytomass at highly degraded area and logged over forest of oil palm plantations

Nurul Athirah Liyana Abdul Rashid, *Ferdaus Mohamat-Yusuff, Faradiella Mohd Kusin and Muhamad Awang

Department of Environmental Sciences, Faculty of Environmental Studies, Universiti Putra Malaysia 43400 UPM Serdang, Selangor, Malaysia
**Corresponding author.Tel.:+603 89468023; email address: ferdius@upm.edu.my*

This study was conducted to determine the aboveground biomass in different scales of oil palm plantation covering biomass of the non-woody plants or known as phytomass such as grass. Sampling sites chosen for this study were an oil palm plantation at Chepor, Perak which was categorized as a logged-over forest area and second site was at Universiti Putra Malaysia (UPM) which was categorized as highly degraded area. Four different identical ages (1992, 2009 and 2011) of palm oil cultivation were chosen at both sites, except for the oldest palm oil tree in UPM, planted in 1973 while in Chepor, planted in 1986. The objectives of this study were to identify the phytomass present in different cultivation ages and in different land usage history, and to determine the contribution of phytomass for carbon sequestration and net carbon balance in the soil of oil palm plantation. The amount of phytomass of four different oil palm ages in UPM were higher in very old and very young cultivation while phytomass at Chepor plantation were at uniform amount at all four plots. In comparing phytomass at Chepor and UPM, the amount of phytomass at Chepor, Perak is 517.95 tonnes per hectare far less than the phytomass at UPM which is 1178.8 tonnes per hectare. The results indicated that history of the land usage has no influence on the amount of phytomass instead of the plantation management. In comparison with the soil carbon stock, this study found that soil in UPM plantation contain higher organic carbon compared to the soil in Chepor plantation. For the carbon storage, it was said that the carbon sequestration is assumed to be about 50% from the biomass amount. In conclusion, phytomass in oil palm plantations influence soil's carbon storage. Soils in highly degraded area in UPM act as effective carbon storage compared to logged-over forest at Chepor plantation.

Keywords: Phytomass, carbon stock, highly degraded area, logged-over forest, carbon sequestration